Vertical Market Outlook Series

Agriculture Equipment

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Purpose of This Study

The Equipment Leasing & Finance Foundation (Foundation) commissioned this forward-looking report on the U.S. agricultural equipment sector. Engine Group was selected to conduct the research. This, the fourth in a series of reports on vertical equipment markets, provides an outlook on the agricultural equipment sector in the U.S., demographic and spending trends, and key developments impacting this sector over the next one to two years.

In preparing this report, Engine Group utilized its pre-existing expertise, coupled with inputs from several outside industry experts and consultants, in analyzing and examining trends in agriculture in the U.S. In addition, broad knowledge of the U.S. macroeconomic environment and the agriculture sector provided a foundation for the report.

How to Use This Report

This report is intended to provoke thought, conversation, and offer high-level insight for equipment finance professionals to reference in strategic planning. There are many subcategories within agriculture. This report focuses on those most relevant to the equipment finance sector, as determined by a Foundation-led Steering Committee of industry professionals.

Agriculture Market Outlook

Smart and Connected Agriculture Market

According to Grandview Research, the global agriculture equipment market size was $139 billion in 2018 and is expected to have a CAGR of 8.9% for the period 2019 to 2025. Continued adoption and integration of modern technologies by farmers to drive improved crop yields and meet the soaring demand for food are expected to be key influencers to market progression. In particular, farm machinery, such as spraying equipment, hay and forage equipment, harvesters, and irrigation and crop processing equipment integrated with technologies like Google Earth, GPS, and robotic systems will be used to enhance overall crop output and quality. Continued farm mechanization, along with the above influencers, will drive greater crop output across the globe. Market progression/growth will also be dependent upon the global trade environment, government subsidies/market facilitation programs, and farmers' ability to access low-cost funding sources.[1]

Technology, such as ground-based sensors, autonomous tractors, and flying drones, aid farmers in producing food at low costs to fulfill growing demand. Farmers are gradually becoming tech-savvy, and the adoption of GPS software products and tractors equipped with telematics are anticipated to spur sales of agriculture machinery over the forecast years. Furthermore, existing and new market entrants have been exploring ways to design high-tech farm equipment to facilitate niche market growth opportunities. Finally, farm labor shortages have only heightened the need for mechanization and integration of technology in farm equipment, both in North America and globally.

Macroeconomic Environment

There is Optimism in Farm Country

Farmers are more favorable about making large investments in farms. This is reflected in the Purdue University, CME Group Ag Economy Barometer, as it improved 15 points to a reading of 136 in October, indicating more optimism among farmers.[2] When asked to look ahead, 53% of the respondents said they expected to see higher farmland values five years from now, compared to 49% a month earlier.[3]

Figure 1[4]

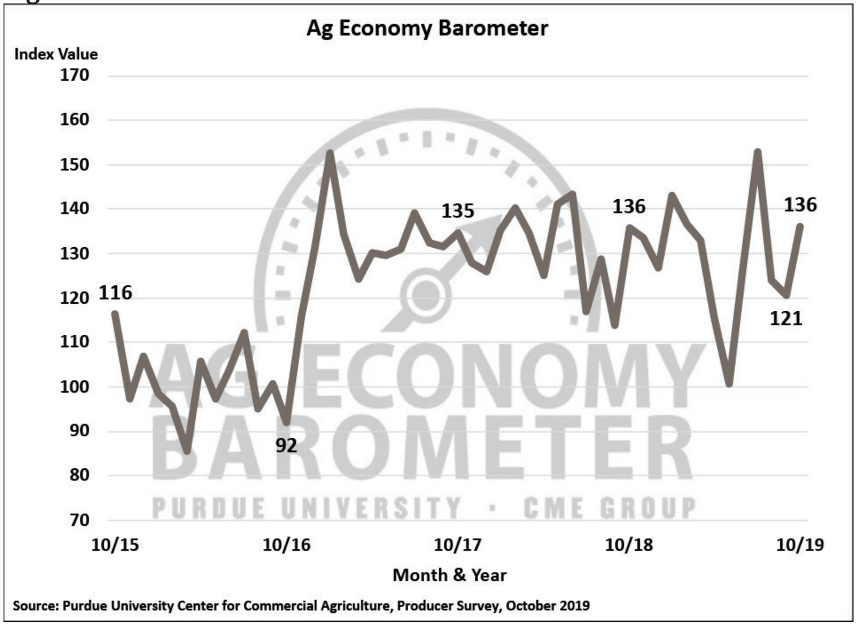
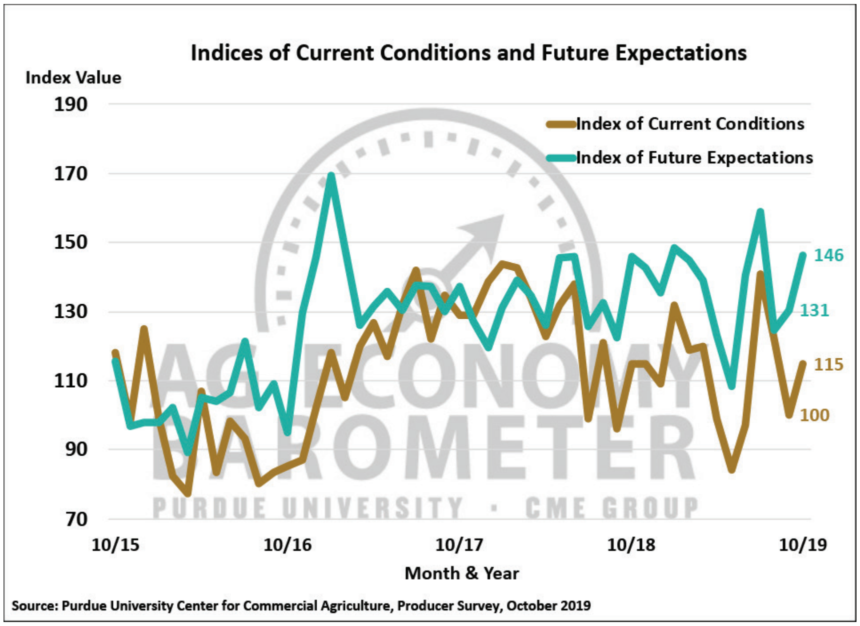
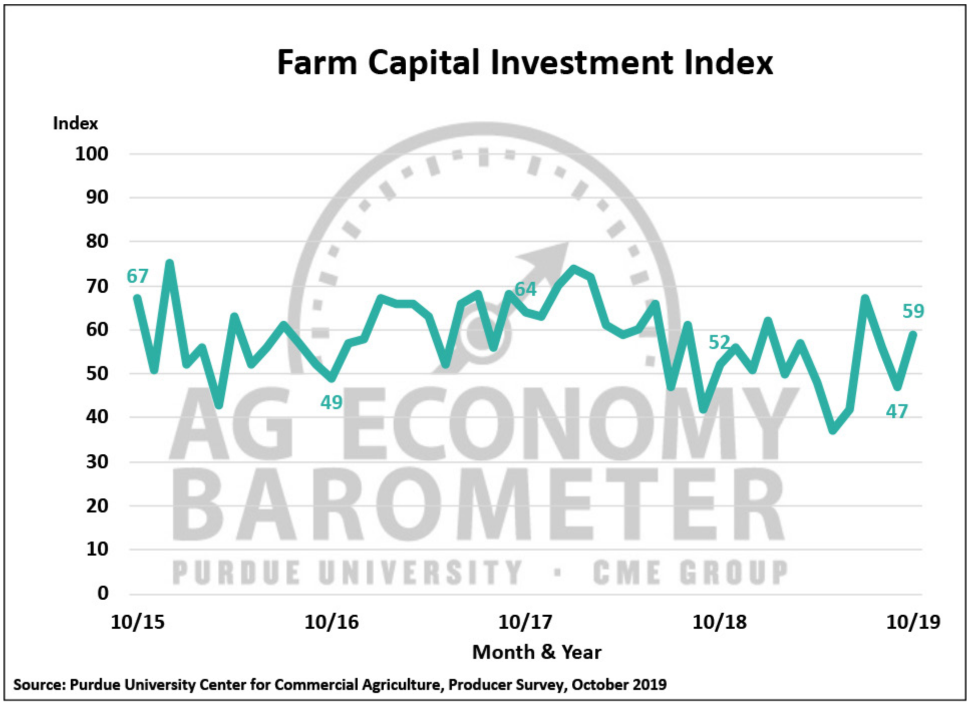


Figure 2[5]



In addition, the Farm Capital Investment Index rose to a reading of 59, 12 points higher than a month earlier. The investment index has been relatively volatile in recent months, dipping to a low of 37 in May before rebounding sharply in early summer. The October reading takes the investment index back to within 8 points of its July 2019 peak of 67.

Figure 3[6]



Survey results, along with continued trade uncertainty with China, reflect farmers' trepidations about making capital investments in their farming operation in the near term.[7]

Federal Reserve Agriculture Capital Expenditure Outlook

In a recent Agricultural Credit Conditions Survey, the Federal Reserve Bank of Minneapolis noted that farm incomes fell from April through June relative to a year earlier, according to results of the second-quarter (July) agricultural credit conditions survey. Spending on capital equipment and farm household purchases also decreased. Falling incomes pushed the rate of loan repayment down slightly, while renewals and extensions increased, though a majority of lenders reported that both were flat. Respondents noted that cropland values generally increased slightly. Although the third-quarter outlook is for continued contraction, fewer respondents predicted decreases in income, capital expenditure, and household spending over the next three months than in the past three months.[8]

Farm Bankruptcy Filings Are Up 24% Versus Year Ago

U.S. farmers are filing for chapter 12 bankruptcy protection at levels not seen for at least a decade, a *Wall Street Journal* review of federal data shows.[9]

Figure 4[10]

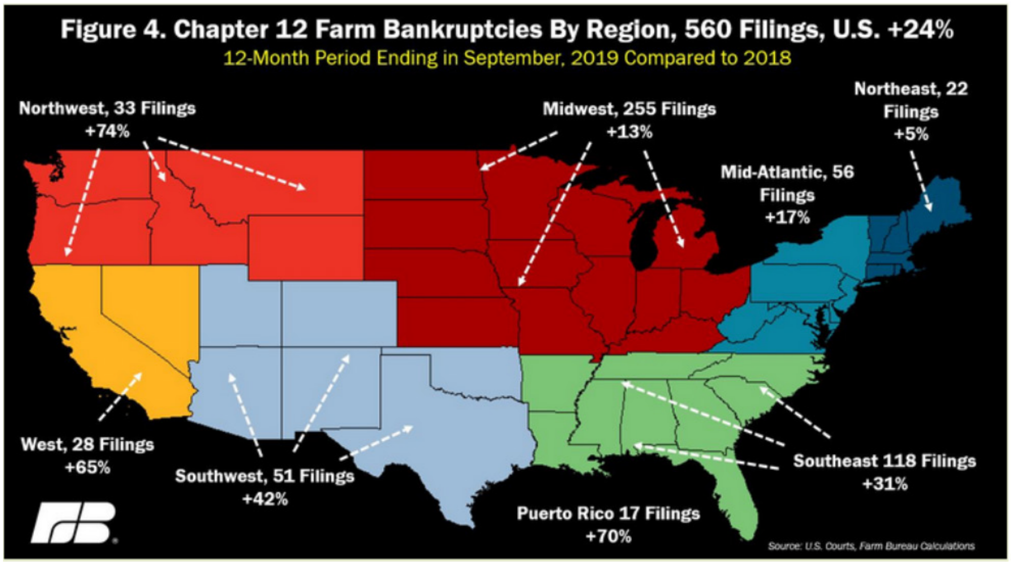
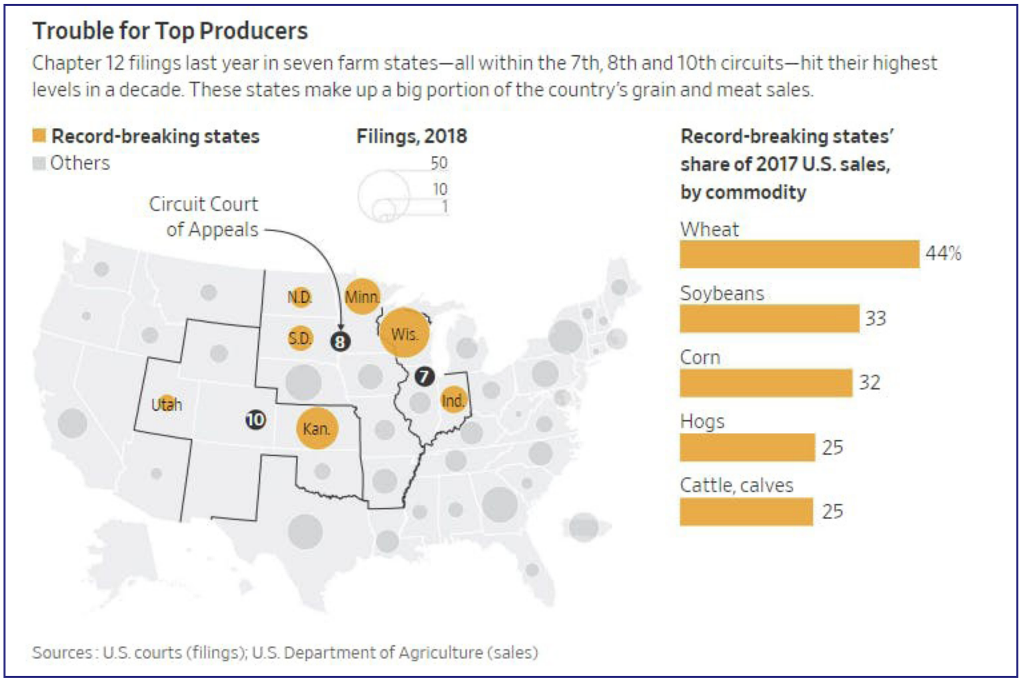


Figure 5[11]



- Bankruptcies in three regions covering major farm states last year rose to the highest level in at least ten years.

- More than half of U.S. farm households lost money farming in recent years, according to the USDA, which estimated that median farm income for U.S. farm households was negative $1,548 in 2018. Farm incomes have slid despite record productivity on American farms because oversupply drives down commodity prices.

- Nationwide, the volume of loans to fund current operating expenses grew 22% in the fourth quarter from year-ago levels, hitting a quarterly record of $58.7 billion, according to the Federal Reserve Bank of Kansas City. The average size of these loans rose to $74,190, the highest fourth-quarter level in history when adjusted for inflation, the bank said.[12]

Farmers Increasingly Turning to Mechanization Due to Labor Shortages

The ongoing labor shortage in agriculture is acute, spanning the nation and impacting all sectors of the industry.[13] California farmers are increasingly turning to mechanization due to labor shortages, according to one survey. More than 40% of farmers in the past five years have been unable to obtain all the workers they needed for their annual crop production, according to a California Farm Bureau survey. The survey finds that about 56% have started using mechanization in the past five years, and of the total, more than half said it was because of labor shortages.[14] The federal government's restrictive immigration policy has contributed to the labor shortage.

Trade War Impact on Farm Equipment

Tariffs and trade tensions are having a negative impact on U.S. farm-equipment manufacturers. The *Wall Street Journal*[15] reported that U.S. farmers are holding machinery longer while their incomes are depressed. Sales of large, high-horsepower tractors in the U.S. and Canada are down 50% from 2013, even though sales grew last year, according to trade-group data. Farmers interested in buying new machinery are finding it tougher to trade in their older models because dealers are sensitive to managing used inventories while trade uncertainties persist. A long-running trend toward consolidation in the Farm Belt has created larger farming operations resulting in greater financial sophistication, optimization of resources, and integration of technology in how they farm. The impacts of this progression, along with equipment manufacturers' efforts to produce higher horsepower and efficient equipment, may influence how farmers determine how often to replace equipment.

A recent *Atlantic* article noted that many farmers are precluded from buying new agricultural equipment because of a combination of higher prices and lower profits. But that puts them in a catch-22. Farmers replace their equipment only every three to seven years. Those who were going to replace it this year and are less certain they can afford upgrading to a newer model year (inclusive of the technology), are deciding to repair and maintain their existing equipment until market dynamics are more stable. Farmers are keeping a close eye on the costs/benefits of this decision.[16]

Though there isn't comprehensive data on how much higher farm-equipment costs are this season, both farmers and equipment dealers around the country have indicated that tariffs have been driving up prices significantly. That's borne out by the Federal Reserve's most recent "Beige Book." The Reserve report showed that manufacturers are still concerned about "higher costs due to tariffs, and ongoing trade policy uncertainty."[17]

Impact of Global Trade War

Approximately 30% of U.S. agricultural equipment production is intended for export, and nearly 30% of U.S. production of construction equipment is also for export. Slow international growth combined with uncertainty about trading rules under the Trump administration could act as a drag on the equipment manufacturing industry's overall performance.[18]

Figure 6[19]

Industrial production growth in key machinery categories

	2014	2015	2016	2017	2018	2019	2020
Construction machinery	5.4	2.3	-4.2	-12.6	4.1	3.6	2.4
Agricultural machinery	-2.8	-10.5	-4.6	-8.7	1.1	3.9	3.4
Mining machinery	1.1	-13.1	-24.3	-7.9	16.0	18.3	10.0
Industrial machinery	-1.3	8.7	2.5	7.3	5.3	5.1	2.5
Engine, turbine, power transmission	0.8	0.8	-12.7	1.2	3.9	3.7	2.4

Source: IHS © 2017 IHS

Farmers are Reluctant to Make Equipment Purchases

The ongoing effects of the trade war, severe weather, and low crop prices have farmers reluctant to make big purchases like tractors, combines, and planters. It was apparent in the U.S. Commerce Department's new report, which shows farm equipment sales were down $900 million over the first three months of 2019. That's the biggest decline in sales since 2016. Farmers will eventually have to replace aging machines, which University of Missouri agricultural economist Pat Westhoff sees it as a temporary situation. But while that old equipment—the kind that Westhoff says don't have "all the new bells and whistles"—stays out in the fields, farmers will be less productive. "(W)e don't make the big advancements in the amount of acreage we can plant per hour and the amount of product we can harvest eventually from those fields," he said.[20]

Climate Change is Transforming How Our Food Gets from Farm to Table

Crops grown in the U.S. are critical for the food supply here and around the world. Farmers in the U.S. supply nearly 25% of all grains (such as wheat, corn, and rice) on the global market. Changes in temperature, atmospheric carbon dioxide (CO2), and the frequency and intensity of extreme weather could have significant impacts on crop yields. Unchecked climate change could mean that the weather conditions hurting farmers this year will become increasingly common and result in higher costs for the federal government, according to a USDA's Economic Research Service report.[21] This report found that if greenhouse gases can continue to increase, U.S. production of corn and soybeans—which are more susceptible to extreme heat during the growing season—could decline as much as 80% in the next 60 years. As a result, corn and soybean prices would skyrocket in that period, as would the cost of crop insurance. According to the study, the cost of crop insurance to the federal government could rise to $7.6 billion a year for corn and $3.3 billion for soybeans. By comparison, the USDA has spent roughly $300 million on insurance for the 2019 crop year as of July 15.[22]

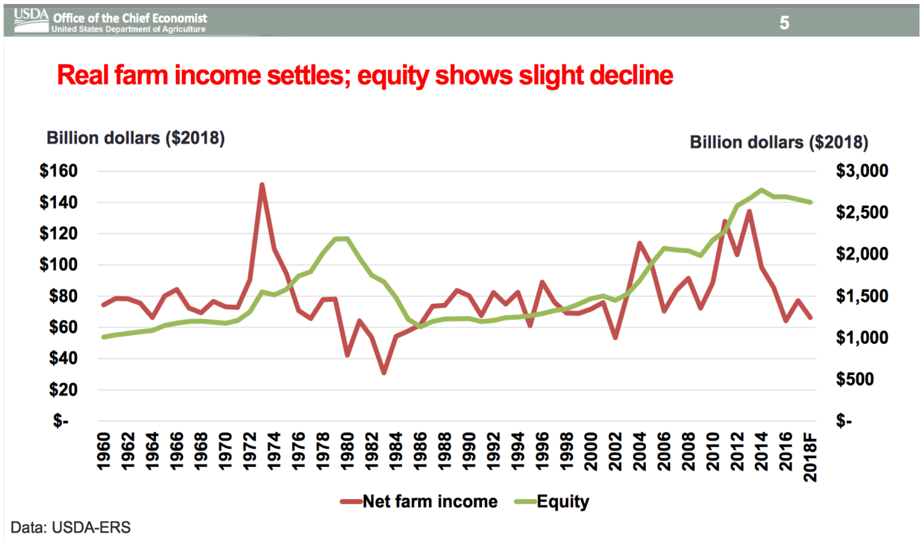
USDA Economic Outlook for Agriculture: Machinery & Crops

Farm production expenditures for tractors and self-propelled machinery was $12.5 billion in 2017 but declined to $11.3 billion in 2018. Another farm machinery expenditure was $5.2 billion in 2018, down from $5.9 in 2017.[23]

Dr. Robert Johansson, the USDA Chief Economist made the following series of comments on U.S. agriculture:

- "A growing U.S. economy helps farm household income but falling commodity prices in recent years for a host of reasons have weighed on farm income. Over the past couple of years, the dramatic fall in net farm income in 2015 and 2016 seems to be leveling out at a lower level.
- U.S. crop forecast: "Our general expectation is for continued declines in real agricultural commodity prices over the next ten years. Falling commodity prices are the result of continued production growth, which continues to outpace global demand."

Figure 7[24]



"While U.S. soybean prices have been slightly buoyed amid some signs of progress in negotiations[25], the export outlook for this year's crop (2018/19) remains challenging. Currently, the U.S. has exported 24 million metric tons of soybean, down 13.5 million metric tons from this time last year. Under the trade dispute, exports to China alone have plummeted by 22 million metric tons or over 90%."

"Under the expectation of continued Chinese tariffs, soybean prices are expected to rise modestly, up $0.20 to $8.80 per bushel as the market begins the multi-year process of working down large stocks, but this follows the prior year's decline of $0.73 per bushel. Alternatively, corn is expected up $0.05 to $3.65 per bushel, but a second year of price increases as carry out stocks are expected to continue their multi-year tightening."[26]

Figure 8[27]

USDA Office of the Chief Economist
United States Department of Agriculture
16

Some prices expected to edge up into 2019

Crop	2019F	%Δ (YoY)	5 year low	5 Year high
Soybeans ($/bu)	8.80	+2.3%	8.60	9.47
Corn ($/bu)	3.65	+1.4%	3.30	3.65
All Rice ($/cwt)	12.20	+0.8%	10.40	12.70
Wheat ($/bu)	5.20	+1.0%	3.89	5.20
Cotton ($/lb)	0.67	-6.9%	0.61	0.72

Data: USDA

Sector-Specific Trends & Key Developments

Locally Grown Foods is Influencing the U.S. Agriculture Market

A powerful trend that has come to augment the growth of the agriculture equipment market is the growing demand for regional and local foods. As food-related awareness is on the rise, the importance of consuming fresh locally grown food is also on an upsurge that has started to forge new pathways for farming families and is attracting investors to agriculture and food-related businesses. According to the USDA, the production and consumption of local and regional food have been increasing. In fact, between 2009 and 2015, the USDA has invested over $1 billion in more than 40,000 local and regional food businesses and infrastructure projects. These significant investments have led to an expansion in the agriculture equipment market, as well.[28]

Small Farms Impact on Future Growth

Mid-size farms are under the most financial pressure and are declining the quickest as they get bought up by larger operations. There are now two classes of farms emerging—production agriculture and direct-to-consumer. “According to the USDA, the U.S. has seen a 61% increase in small farms from 1992 to 2012.” Not every farmer will fit into today’s definition of production agriculture, and ag institutions will have to consider how they will serve both classes of farmers. Data suggest that more farmers may be unwilling or unable to stay in business if current economic conditions continue. U.S. Agriculture debt totaled $410 billion in 2018. According to an industry observer, farm operations have been “largely propped up by low-interest rates and higher than average land values. We are starting to see the operating profitability of these farms declining and it’s making it harder and harder to pay back loans.”[29]

Farming for the Future: Precision Agriculture

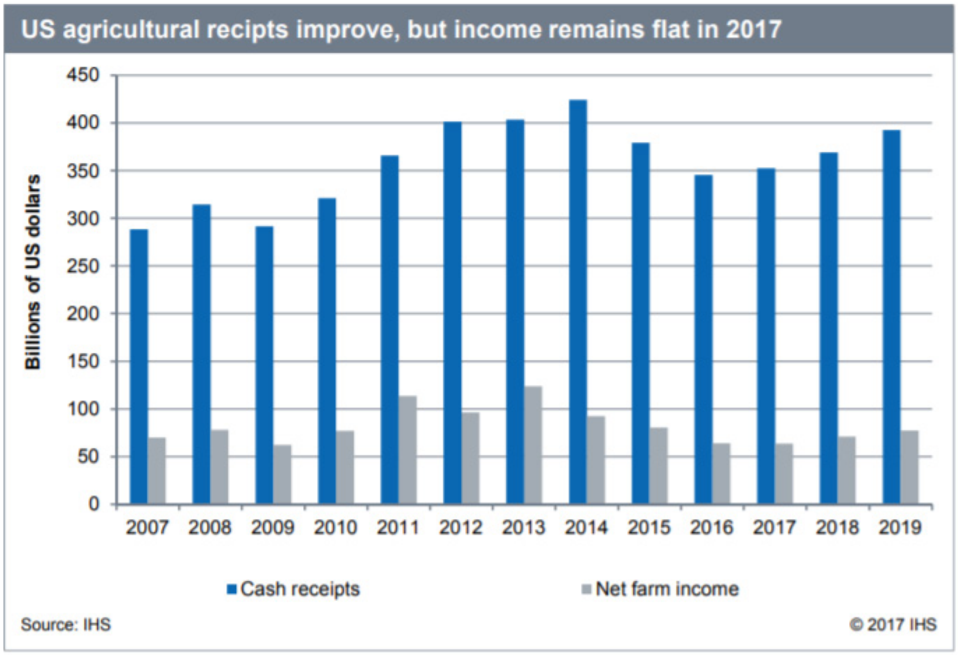
The pursuit of increasingly efficient agricultural practices has led to a new wave of technological innovations. Specifically, the field of precision agriculture is focused on capturing farm data and using it to benefit global food production and environmental security.

For example, variable-rate technologies (VRTs) have allowed farmers to make more customized land management decisions, enabling more efficient use of inputs such as seeds, fertilizers, and pesticides under variable in field conditions. This technology allows farmers to manage their inputs foot by foot, rather than field by field, and enable practices that both save money on inputs and reduce the on- and off-field impacts of those inputs. By 2016, between 15 and 40% of U.S. farms, depending on the crop, used variable-rate application equipment.[30] Precision agriculture is key to increase environmental performance while improving yields and reducing inputs and costs.[31]

Many farmers now have a robust amount of information at their fingertips. From sensors embedded in farm machinery to satellite images, data is flowing everywhere. It is estimated that by 2025 an average-sized farm will produce more than one million data points a day. The challenge facing farmers is to identify the vital data elements that will have the greatest impact on the overall financial health and outlook of the farm.[32]

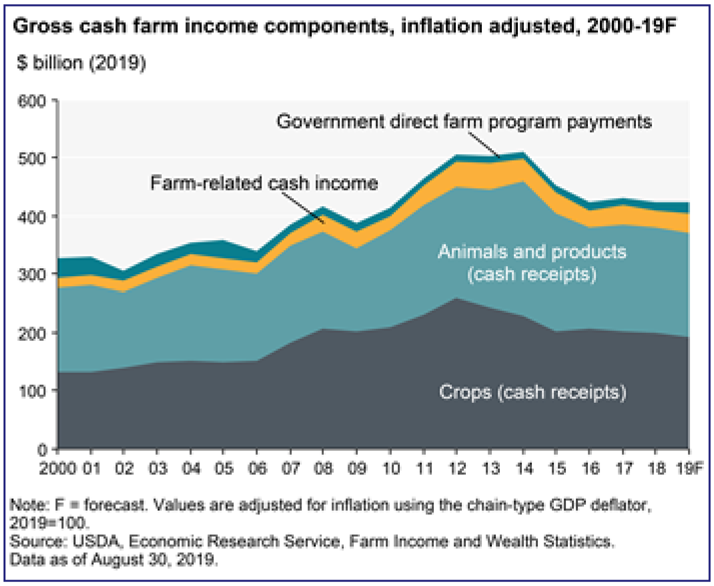
Farm Income Fluctuations

Figure 9[33]



Net farm income (NFI)—which reflects income after expenses from production in the current year—is calculated by subtracting farm expenses from gross farm income. NFI considers both cash and noncash income and expenses. Inflation-adjusted net farm income is forecast to increase almost 3% in 2019, to $88 billion. Inflation-adjusted farm production expenses are projected to decrease 1% in 2019.

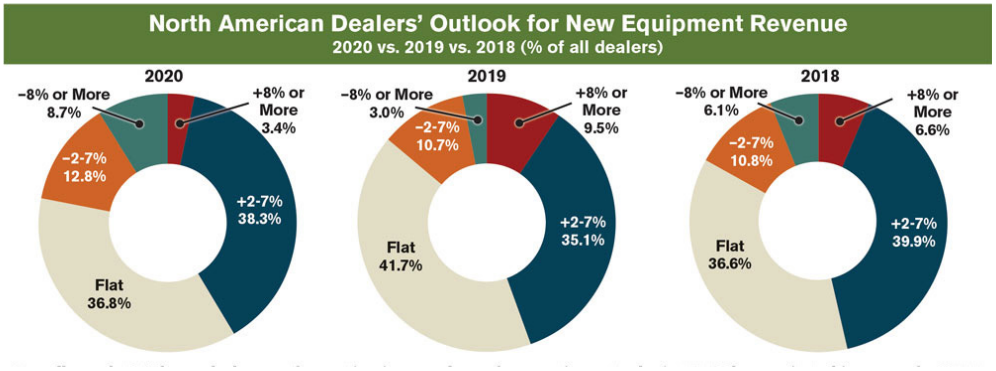
Figure 10[34]



2020 New Farm Equipment Sales

Based on the results of the 2020 Dealer Business Outlook & Trends survey, agriculture equipment dealers are slightly less optimistic about their potential to improve revenues in the year ahead compared to a year ago. The survey, which was conducted during three weeks in August and September 2019, shows that 41.7% of U.S. and Canadian dealers expect a pickup in new equipment revenues in 2020. Broken down further, only 3.4% of respondents expect revenues to increase by 8% or more, while 38.3% are projecting an improvement in the 2-7% range. This compares with 44.6% in last year's study, where 9.5% of dealers had forecast an 8% or more increase and 35.1% anticipated growth in the 2-7% range.[35]

Figure 11[36]



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Endnotes

[1]https://www.grandviewresearch.com/industry-analysis/agriculture-equipment-market

[2]http://www.agrinews-pubs.com/news/brighter-farmer-outlook-optimism-on-trade-economy-improves-in-october/article_85161c56-059c-11ea-afad-7f7f1d72f2fd.html; https://ag.purdue.edu/commercialag/ageconomybarometer/

[3]http://www.agrinews-pubs.com/news/brighter-farmer-outlook-optimism-on-trade-economy-improves-in-october/article_85161c56-059c-11ea-afad-7f7f1d72f2fd.html

[4]https://ag.purdue.edu/commercialag/ageconomybarometer/farmer-sentiment-on-trade-and-the-overall-ag-economy-improves-as-fall-harvest-gets-underway-2/

[5]ibid

[6]ibid

[7]https://www.agriculture.com/news/business/optimism-falls-in-farm-country-ag-barometer-shows

[8]https://farmpolicynews.illinois.edu/2019/08/federal-reserve-ag-credit-surveys-2019-second-quarter-farm-economy-conditions/

[9]https://moneymaven.io/mishtalk/economics/us-farm-belt-bankruptcies-climb-canada-the-beneficiary-of-trump-s-trade-policy-oh11cy6VL061KZL7NqkRnA/

[10]https://www.drovers.com/article/farm-bankruptcy-filings-are-24-over-year-ago-levels

[11]https://moneymaven.io/mishtalk/economics/us-farm-belt-bankruptcies-climb-canada-the-beneficiary-of-trump-s-trade-policy-oh11cy6VL061KZL7NqkRnA/

[12]https://www.beefmagazine.com/farm-life/silver-lining-agricultural-downturn

[13]https://www.agri-pulse.com/articles/11910-what-will-tomorrows-ag-workers-and-farmers-look-like

[14]https://www.cnbc.com/2019/05/01/farmers-turning-to-mechanization-due-to-labor-shortages-says-survey.html

[15]"Trade Fight Dings Farm Equipment," Wall Street Journal, May 29, 2019

[16]https://www.theatlantic.com/politics/archive/2019/03/tariffs-drive-farm-income-down-and-equipment-prices/583684/

[17]https://www.theatlantic.com/politics/archive/2019/03/tariffs-drive-farm-income-down-and-equipment-prices/583684/

[18]http://www.aem.org/AEM/media/docs/Advocacy/AEM-Economic-Research-Report.pdf?kui=BXL2yAsW3fcWwf-RVQOWuQ#_ts=1489089950540

[19]http://www.aem.org/AEM/media/docs/Advocacy/AEM-Economic-Research-Report.pdf?kui=BXL2yAsW3fcWwf-RVQOWuQ#_ts=1489089950540

[20]https://www.harvestpublicmedia.org/post/farm-equipment-sales-drop-early-2019-trade-war-s-effects-linger

[21]https://www.wsj.com/articles/usda-report-sees-dire-climate-change-impact-on-u-s-crops-11563917840

[22]https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-agriculture-and-food-supply_.html

[23]https://www.nass.usda.gov/Publications/Todays_Reports/reports/fpex0819.pdf

[24]https://farmpolicynews.illinois.edu/2019/02/the-2019-outlook-for-u-s-agriculture-from-usdas-chief-economist/

[25]https://farmpolicynews.illinois.edu/2019/02/u-s-china-trade-talks-in-washington-this-week/

[26]https://farmpolicynews.illinois.edu/2019/02/the-2019-outlook-for-u-s-agriculture-from-usdas-chief-economist/

[27]ibid

[28]https://www.marketwatch.com/press-release/2019-24-agriculture-equipment-market-by-industry-trends-regional-forecast-2019-08-29

[29]https://www.agweek.com/opinion/columns/4571716-six-trends-shaping-future-farming-and-ranching

[30]https://www.precisionag.com/market-watch/usda-outlines-adoption-trends-for-precision-agriculture/

[31]https://www.futurefarming.com/Smart-farmers/Articles/2019/1/Why-is-adoption-of-precision-ag-so-slow-385338E/

[32]https://news.ncsu.edu/2019/10/on-farm-data/

[33]http://www.aem.org/AEM/media/docs/Advocacy/AEM-Economic-Research-Report.pdf?kui=BXL2yAsW3fcWwf-RVQOWuQ#_ts=1489089950540

[34]https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/farming-and-farm-income/

[35]https://www.farm-equipment.com/articles/17536-dealer-optimism-in-short-supply-for-2020

[36]ibid

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